
Assessing the Implementation of Environmental Education in Selected Vosloorus Township Schools

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Abstract: The aim of the study was to assess how teachers from selected primary schools in the Vosloorus township, implement Environmental Education. The study was conducted to improve the implementation of EE to combat environmental problems, and was therefore applied in the Vosloorus township where the study was conducted. Data were collected by means of face-to-face interviews, focus group interviews, and observation. Three primary schools in Vosloorus were sampled. One experienced teacher who specialises in Social and Natural Sciences was selected purposively from each school, along with a group of six to eight learners. In the process of analysing the data, predefined themes and categories that emerged from the content analysis, were used. The findings emerging from the study indicated that the methods most frequently employed in teaching the content of Environmental Education, were lecturing and question-and-answer. Due to the demanding curriculum, teachers were unable to mitigate environmental problems outside of the classroom; they had divergent perceptions and understandings of the concept of EE; they met with their learners' parents once a year to discuss environmental problems and some even conducted annual clean-up campaigns; and most teachers attended workshops related to those Environmental Education components which are incorporated in the Natural and Social sciences.

Keywords: Environment, Environmental Education, Land Pollution, Sustainability, Sustainable Development

1. Introduction

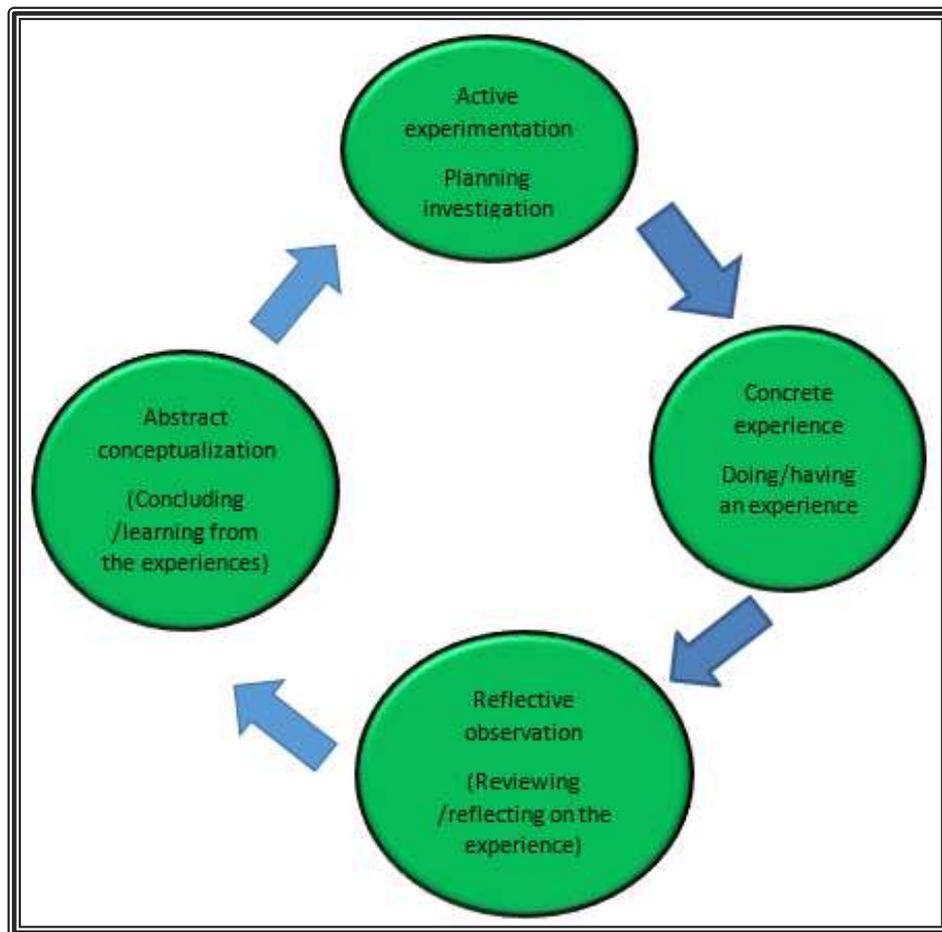
Current environmental crises, such as land, air and water pollution, as well as deforestation in communities around the world, need to be eradicated through the effective implementation of Environmental Education (EE) in schools. All members of the community should assume shared responsibility, to ensure that the resources of our planet are sustained, thereby affording current and future generations an opportunity to utilise and enjoy the earth's resources.

Study which assessed the implementation of EE in Vosloorus township schools was deemed worthwhile, since many South African schools in similar contexts are exposed to an environment characterised by littering, water pollution, inadequate sanitation, deforestation, and communities which contribute (wittingly or unwittingly) to activities associated with air pollution, such as the burning of papers or waste. As Harmse remarks, in South Africa, coal is still used as the primary source of energy [11]. Balmer confirms that coal is often used in township households and small enterprises,

because most people can afford to buy it [1]. Not only does each learner have a preferred mode of learning, but as Dreyer and Loubser point out, teachers must also use different methods of teaching to accommodate diverse modes, so that learners can demonstrate their knowledge, skills, values, and attitudes during the process of teaching and learning [8]. As will become evident later in this paper, despite the advice of Dreyer and Loubser, from the findings reported on here, the dominant methods which teachers used when teaching EE-related content, were lecturing and the question-and-answer method [8]. Bronfenbrenner's theory of ecological systems states that the behaviour and attitudes of learners reflect the community from which they come [2]. For Hewitt a curriculum that only includes theoretical knowledge may not have a marked impact on the environment, therefore learners must actively participate in the life of their community, by working to solve environmental problems [12]. Loubser explains that EE action activities in the community may include cleaning up a sidewalk marred by litter, or a local river bank [18]. According to Villegas-Reimers, a

professional teacher is considered to be one of the most valuable tools in ensuring the delivery of a quality education in schools [30]. Effective professional development may take the form of interaction among educators, and with other stakeholders, such as administrators and parents. Paul and Volk suggest that teachers, who continuously undergo professional development regarding EE, are more likely to implement related programmes [26]. In contrast with the above statement Gordon confirms that even though teachers undergo professional EE development, this does not guarantee that they will be confident about such implementation [10]. According to Flogaitis and Agelidou, EE enables learners to develop skills and knowledge that will help humanity to mitigate environmental problems now, and in the years to come [9]. EE also enables learners to develop a positive attitude towards, and appreciation for, their

environment and the world at large. This statement by Flogaitis & Agelidou, was found to be true, since the AR which this researcher conducted, enabled learners from the sampled Vosloorus township schools to take a stand in mitigating environmental issues, by engaging in action campaigns that included cleaning operations, the recycling of white paper, and the reporting and/or fixing of leaking taps. Despite the benefits of implementing there are some challenges of implementing [9]. Pulkkinen claims that most teachers are able to integrate EE in the Life Sciences and Geography, as much of the subject content already deals with the environment [27]. Worryingly, a study conducted by Mudaly and Ismail revealed that teachers do not receive much (if any) support from their school management teams (SMTs), and if that body is disinterested in EE, it will impede the successful implementation thereof [22].



Source: Kolb (1984)

Figure 1. Kolb's Experiential Learning Cycle.

1.1. Theoretical Framework

This paper uses Kolb's experiential learning theory, which views learning as a continuous process in which knowledge is created through the transformation of experience [14]. Palmberg and Kuru view EE as experiential, and for that reason the expectation is that teachers will afford learners an

opportunity to engage directly with nature [24]. Kolb's experiential learning theory was deemed appropriate to use, as his ideas align with the AR process and goal of bringing change to a community, through action. Guided by Kolb's

experiential learning theory, I was able to observe the behaviour of learners towards the environment. In addition I was able to observe learners through the guidance of an adult (general worker) fixing leaking taps. Furthermore, action took on the form of campaigns that included cleaning the terrain, fixing dripping taps, conserving water by using rainwater collected in buckets or drums, to irrigate crops and recycling of white paper.

1.2. Problem Statement

It is assumed that the poor implementation of EE by teachers might be the cause to the environmental issues, which are in evidence in Vosloorus township. As a factor, Teachers from that township might not involve learners or community members in efforts to implement EE. As a result, community members and learners clearly engage in activities that are harmful to the environment, amongst others, by littering, burning wood and coal, advancing deforestation, and practising inadequate sanitation. The impact which this type of behaviour has on the environment is contrary what the constitution of South Africa advocates, namely the right of each citizen to have his/her health and wellbeing safeguarded, by living in an environment which is not harmful now, or will not become so in the future [28].

1.3. Research Question

To assess the implementation of EE in Vosloorus township schools, the following main research question had to be addressed:

How do teachers implement EE in teaching and learning?

2. Methodology

This paper focused on qualitative approach within the paradigm of interpretative. The aim was engage closely with the participants to find out how do teachers implement EE in teaching and learning? Creswell and Creswell indicate that qualitative research approach allows the researcher to understand the feelings and perception of individuals in their respective settings [4].

2.1. Research Design

This paper followed action research design. Dick defines AR as a method which seeks to combine research and action, with a view to spurring change or bringing about some kind of community transformation [5]. This researcher chose to do AR into how EE is implemented in township schools, given evidence of poor environmental management in the greater Vosloorus. To that end, the researcher worked with teachers, learners and parents, to mitigate existing environmental problems in the immediate vicinity of the schools and surrounding areas. Action took on the form of campaigns that included cleaning the terrain, fixing dripping taps, and conserving water by using rainwater collected in buckets, water tank (jojo) and watering cans, to irrigate crops and recycling of white paper.



Figure 2. Water tank used to store water to irrigate crops at school A.



Figure 3. Using watering cans to irrigate crops at school A.



Figure 4. Recycling of white paper at school C.

2.2. Participants

Three primary schools in Vosloorus were sampled. One experienced teacher who specialises in Social and Natural Sciences was selected purposively from each school, along

with a group of six learners. Convenience sampling was employed, since the various participants, in their respective settings, were readily available to take part in the study. McMillan and Schumacher point out that convenience sampling involves using non-probability as a method, to select individuals who are willing to make themselves available to participate in an academic study [19].

2.3. Data Collection Methods

McMillan and Schumacher, view data collection methods as a way of gathering evidence in qualitative research. Data was collected by means of face-to-face interview, focus group interviews and observations [19].

2.3.1. Face-Face Interviews

According to Lavrakas, face-to-face interviews are also known as in-person interviews, and are preferred by qualitative researchers, in addition to being one of the oldest forms of data collection. Three teachers were sampled for face-to-face interviews. Interview guide comprised of semi-structured questions were used to record evidence produced by the participants [15].

2.3.2. Focus Group Interviews

Parker and Tritter consider a focus group to enable a structured yet informal discussion among study participants. 18 learners 6 per school took part in the focus group interviews using an interview guide [25].

2.3.3. Observations

McMillan and Schumacher state that observation is a process in which a researcher views and listens to what is happening naturally, in a research site. Observations were also conducted to understand the behaviour of learners towards the environment [19].

2.4. Data Analysis

Data will be analysed using a content analysis. Cohen, Manion and Morrison view content analysis as a process, in which data is summarised and reported. During process of analysing data. I used predefined themes and categories that emerged from content analysis. I carefully read my transcribed data, line by line then I divided my data into meaningful analytical units (i.e., segmenting the data). My data was coded line by line by giving data a label to each code [3].

2.5. Rigour

According to Loh, a study is considered to be a work of quality, if it (amongst others) meets the requirement of trustworthiness. [17]. According to McMillan and Schumacher, the researcher can enhance validity by using different strategies – in this instance that was achieved by employing the following two strategies:

Doing Member Checking

Using Multiple Strategies (Triangulation) [19].

2.6. Location of the Study



Figure 5. Aerial View of Vosloorus Township.

The study took place in Vosloorus, which is situated east of Katlehong and Alberton. The three primary schools where the study was conducted are considered to be Quintile 3 schools, also known as “no-fee schools”. These schools cater for three phases, namely the Foundation, Intermediate and Senior phases. Enrolment at each of the schools is just more than 1 000 learners. The home languages (HLs) taught in these schools include Sesotho, IsiZulu and Northern Sotho.

2.7. Ethical Compliance

The following ethical principles applied when dealing or working with participants: informed consent was given to participants, confidentiality and anonymity were guaranteed.

3. Results and Discussion

3.1. Research Sub-question 1

What is teachers’ understanding of the concept of EE?

Findings:

The findings revealed that the participants had diverse opinions on what EE entails, but in the main they stated that it is about educating people to care about their environment, and about sharing expertise about nature. These findings are supported by Dobrinski and Upitis, who acknowledge the existence of a multitude of views on the concept of EE [7]. The participants associated EE with the biophysical environment, albeit that it is embodied in other dimensions, including the political, economic and social (O’Donoghue & Janse van Rensburg, [23].

3.2. Research Sub-question 2

Theme 4: Teaching and Learning Methods in EE

Which teaching methods do teachers use, when delivering content aligned to EE?

Findings:

The study found that the participants, in teaching content aligned to EE, predominantly used lecturing and question-and-answer as methods. Learners were not often allowed

outdoors as part of lessons dealing with the environment, which aligns with the findings of McCarty et al. that disadvantaged learners are mostly subjected to chalk-and-talk desk-bound lessons, which do not engage them [20]. Clearly, Kolb's theory of experiential learning was not in evidence, therefore learners had no scope to learn through experience, or by actually doing.

3.3. Research Sub-question 3

What are the challenges facing teachers when teaching EE in schools?

Findings:

The findings revealed that most of the participants encountered challenges when teaching EE, including a very full CAPS curriculum, which left them with little time for lessons outside of the classroom. The sampled teachers were more concerned about completing the curriculum content, as the GDE facilitators monitored their progress. As Dillon et al. Concede, often curriculum requirements prevent teachers from making their EE lessons more interactive in nature [6]. Ko and Lee concede that too-full classes make experiential learning a challenge, with so many learners becoming difficult to control [13]. Dillon et al. insists that the safety of the learners, when not in controlled situations, was identified as another limiting factor [27].

3.4. Research Sub-question 4

How do teachers form partnerships with parents, to ensure the effective implementation of EE?

Findings:

The findings revealed that the participating schools indeed formed partnerships with parents to discuss environmental problems, by meeting once a year to take action by cleaning the terrain and surroundings. However, annual meetings did not bring about significant change in terms of resolving the environmental problems that were visible on the school terrain and in the neighbouring area. The sampled schools were thus not "isolated islands" Uzzell [29]. These findings align with the ideas outlined by Uzzell in his second model, where the local community is invited into the school. Such engagement on the part of the community can only benefit a school [29].

3.5. Research Sub-question 5

How do learners behave towards their environment?

Findings:

According to the findings of this study, at the schools in question, the learners were unable to close leaking taps, as they were broken. Not all schools were found to use water tanks to conserve water, but used hosepipes connected to taps to irrigate. At all three schools, learners caused land pollution by littering, which poses a health hazard. According to Dreyer and Loubser, in South Africa pollution is a challenge, with paper and plastic items being discarded without consideration for the environment. The serious consequences of pollution include land degradation, and a loss of

biodiversity [8].

3.6. Research Sub-question 6

How do teachers acquire knowledge regarding the implementation of EE?

Findings:

The findings suggest that most teachers attend related workshops, where components are incorporated in the Natural and Social Science syllabi. Despite this, challenges persist. As Gordon points out, undergoing professional development related to EE does not guarantee the effective implementation thereof. This can be attributed to the fact that workshops aim to capacitate teachers in all the content of the curriculum, rather than EE specifically [10].

4. Limitations

The identified limitations of the study, included the following:

- 1) Time and financial constraints had an impact on the data-generation process, meaning the findings cannot be generalised across the country.
- 2) The study only focused on qualitative research, whereas if a mixed-method approach had been employed, additional data may have emerged.

5. Conclusion

This paper, which assessed the implementation of EE in selected Vosloorus township schools, answered the main research question. Prior to that, the aims and objectives were clearly formulated; data were collected by means of face-to-face interviews, focus group interviews and observation which allowed for data triangulation; and the presentation, analysis and interpretation of the data allowed the researcher to structure the findings of the study.

For future research purposes, AR may be conducted to determine how schools can employ effective methods of teaching/learning content aligned to EE, specifically in the context of South Africa. Also, schools should manage waste and conserve water effectively, using up-to-date technology, where feasible. Thus, bringing change or improvement to a society, is where action research is most useful. As Mertler states, AR is a systematic inquiry, undertaken by educational stakeholders whose goal is to enhance learners' learning [21].

Some of the recommendations made here, emphasise the importance of using AR when implementing EE, as a hands-on approach can help to mitigate environmental problems even if they are very limited in scope. This aligns with Kolb's (1984) theory of experiential learning, which encourages learners to learn through experience, and by doing. By facilitating direct engagement with nature, teachers can raise awareness amongst their learners about environmental matters, and teach them to take responsibility for the natural environment, so that future generations may also reap the benefits.

6. Recommendations

6.1. Research Sub-question 1

Teachers should be encouraged and incentivised to enrol for EE courses and workshops, which should be held at least once a term. That will expand their understanding of the concept, and raise awareness of all four dimensions (the biophysical, economic, political, and social).

6.2. Research Sub-question 2

When teaching EE-related content, teachers need to employ various methods to engage and excite learners, and capture their interest. Given the amount of work stipulated by the curriculum, the suggestion is that teachers take their learners out of the classroom once or twice a week, to engage with nature and raise awareness of, and find possible solutions to, environmental problems at the school and in the surrounding areas.

6.3. Research Sub-question 3

The teaching and learning of EE should be based on action. Given how many written activities are required of learners (by the DBE), once-weekly action-based activities would not greatly affect their output. This correlates with the views of Lee and Williams, that EE enables learning through action, raises awareness in learners (and their families and peers), and persuades them to act responsibly towards their own environment [16].

6.4. Research Sub-question 4

While partnerships were formed with the learners' parents in an attempt to eradicate environmental problems through clean-up campaigns, such initiatives and meetings should not be conducted only once a year, but rather every quarter.

6.5. Research Sub-question 5

- 1) Teachers, grounds men or community members can be called on to fix broken taps, while learners should be taught to report such instances.
- 2) Schools should store water, by using buckets and water-storage tanks.
- 3) In this era of the Fourth Industrial Revolution, schools should use aerators to save water. These devices can be fitted to taps, to control the flow of water.
- 4) Learners should be encouraged to pick up any waste papers after break and after school. This should be done under the supervision of a teacher, and prefects can be assigned to assist teachers in monitoring the learners. The teachers and prefects can set an example, by also helping out.
- 5) Learners should not only recycle white paper, but also other recyclable materials such as tin cans, bottles and boxes.

6.6. Research Sub-question 6

Teachers should not only depend on DoE workshops, but

should enrol for short courses offered by other institutions, to upskill themselves. Universities and colleges should form partnerships with NGOs which offer EE programmes, such as the Delta Environmental Centre, Wessa, and World-Wide Fund for Nature (WWF).

6.7. Recommendations for Further Research

Recommendations for further studies are as follows:

- 1) Further research in connection with the implementation of EE should include primary (grades 1–7) and high (grades 8–12) school learners and teachers, because EE-related content can also be taught to more senior learners.
- 2) Further research on the implementation of EE may include the views of curriculum advisers and community members, or other stakeholders of the schools in question.
- 3) The focus need not only be on townships schools, but must ideally include so-called former Model C schools, because environmental problems occur in both township and suburban areas.
- 4) Further research may investigate how lecturers at tertiary institutions train student teachers, as they prepare them to implement EE in their lessons.

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